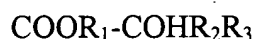


Appl. No. : 10/017,453
Filed : December 12, 2001

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method for the preparation of a composition for electroplating a copper-containing layer on a substrate, comprising the steps of:

(i) providing an aqueous solution comprising at least:
a source of copper Cu (II) ions,
an additive to adjust the pH to a predetermined value, and
a complexing agent for complexing Cu (II) ions, said complexing agent having the chemical formula:



wherein R₁ is ~~an organic~~ a hydrocarbon group covalently bound to the carboxylate group (COO),

R₂ is either hydrogen or an organic group, and

R₃ is either hydrogen or an organic group,

said solution comprising no reducing agent,

(ii) providing electrons from a source not being in direct contact with said solution, through transport means providing contact between said source and said solution.

2. (Original) A method according to claim 1, wherein the source supplying electrons is placed in said solution.

3. (Original) A method according to claim 2, wherein the source supplying electrons is a current generator or a battery.

4. (Original) A method according to claim 3, wherein the transport means comprise electrodes bound to wires.

5. (Currently amended) A method according to claim 2, wherein the source supplying electrons has a current density ~~comprised between~~ of from 0.32 mA/cm² to 3.82 mA/cm².

6. (Original) A method according to claim 1, wherein R₂ is hydrogen and R₃ is an organic group.

7. (Currently amended) A method according to claim 1, wherein R₂ is hydrogen and R₃ is ~~-CHOH-COOR₁~~ -CHOH-COOR₁.

8. (Canceled)

Appl. No. : 10/017,453
Filed : December 12, 2001

9. (Currently amended) A method according to claim 1, wherein said complexing agent is selected from the group consisting of L-diethyltartrate, L-diisopropyltartrate, L-dimethyltartrate, L-dibutyltartrate, ~~L-diethylacetate~~, D-diethyltartrate, D-diisopropyltartrate, D-dimethyltartrate, D-dibutyltartrate, ~~D-diethylacetate~~ and ~~a mixture of any of the foregoing mixtures thereof.~~

10. (Original) A method according to claim 1, wherein the source of copper Cu(II) ions in the solution is $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$.

11. (Original) A method according to claim 1, wherein the additive to adjust the pH of the composition is $[\text{Me}_4\text{N}]\text{OH}$ (TMAH).

12. (Currently amended) A method according to claim 1, wherein the pH of said composition is ~~comprised between from 11 and to 13.5, more preferably between 12 and 13.5, more preferably between 12.3 and 13.3.~~

13. (Currently amended) A Process for forming at least one copper-containing layer on a substrate comprising at least the step of electroplating a copper-containing layer onto said substrate in a first electroplating bath, wherein said electroplating bath is the composition prepared by the method according to ~~any one of the preceding claims~~ claim 1.

14. (Currently amended) A process according to claim 13, wherein the temperature of the composition is ~~comprised between from 10°C and to 50°C, preferably between room temperature and 45°C.~~

15. (Original) A process according to claim 13, wherein said copper-containing layer is formed directly on said substrate.

16. (Original) A process according to claim 13, wherein said copper-containing layer is formed indirectly on said substrate after a pre-step of forming a primary layer on said substrate, so that said copper-containing layer is formed on said primary layer.

17. (Original) A process according to claim 16, wherein said primary layer is a copper diffusion barrier layer.

18. (Currently amended) A process according to claim 17, wherein said copper diffusion barrier layer is metal conductive ~~or not~~.

19. (Original) A process according to claim 18, wherein said copper diffusion barrier layer is selected from the group consisting of a Ti layer, a TiN layer, a Ta layer, a WN_x layer, a TaN layer, a Co layer and a Co-alloy layer.

Appl. No. : **10/017,453**
Filed : **December 12, 2001**

20. (Original) A process according to claim 13, wherein the resulting copper-containing layer is a copper seed layer.

21. (Original) A process according to claim 20, further comprising the step of forming another copper-containing layer on the last formed copper seed layer using a second electroplating bath.

22. (Original) A process according to claim 21, wherein the second electroplating bath is the first electroplating bath used for forming the copper seed layer.

23. (Original) A process according to claim 21, wherein the second electroplating bath is a cupric-sulfuric acid-based electroplating bath.

24. (New) A process according to claim 13, wherein the temperature of the composition is from room temperature to 45°C.

25. (New) A method according to claim 1, wherein the pH of said composition is from 12 to 13.5.

26. (New) A method according to claim 1, wherein the pH of said composition is from 12.3 to 13.3.

27. (New) A process according to claim 17, wherein said copper diffusion barrier layer is not metal conductive.